

Protein Synthesis
“What Happens when DNA Is Mutated”

Initial DNA Sequence (always refer to this sequence when starting a new problem)

G A T T A C T G A G G A T C G G A A T A C T T C A G C T C T T A G C A T T G C A T T

1. To understand what happens under normal condition, transcribe this DNA strand into its mRNA.

mRNA =

Using this newly made mRNA, translate it into its corresponding protein fragment.
Don't forget to look for start and stop codons.

protein fragment =

2. Referring to the original DNA strand, change the 29th base from cytosine to adenine.

mRNA =

protein fragment =

What happened?

3. Referring to the original DNA strand, change the 9th base from adenine to cytosine.

mRNA =

protein fragment =

What happened?

4. Referring to the original DNA strand, insert thymine between the 3rd and 4th base.

mRNA =

protein fragment =

What happened?

5. Referring to the original DNA strand, insert guanine between the 12th and 13th base.

mRNA =

protein fragment =

What happened?

6. Referring to the original DNA strand, delete the 16th base, guanine, from the sequence.

mRNA =

protein fragment =

What happened?

SUMMARY – Review

A. Describe a mutation caused by SUBSTITUTION. What are the possible results?

B. Describe a mutation caused by an INSERTION. What are the possible results?

C. Describe a mutation caused by a DELETION. What are the possible results?

D. Which type of mutation would cause the most damage to the structure of a protein? Explain your reasoning.